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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,137	08/20/2003	Kevin K. Lehmann	PRU-103US	6484
23122	7590	06/05/2006	EXAMINER	
RATNERPRESTIA			SIEFKE, SAMUEL P	
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DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/644,137	<b>Applicant(s)</b> LEHMANN ET AL.	
	<b>Examiner</b> Samuel P. Siefke	<b>Art Unit</b> 1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 48-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/20/03</u> ) <u>416105, 5115106</u> | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-47, drawn to an optical sensor, classified in class 422, subclass 82.05.
- II. Claims 48-50, drawn to method of detecting an analyte, classified in class 436, subclass 164.

Inventions Group II and Group I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the method can be practiced by hand, i.e. positioning the optical fiber in a gas or liquid by hand.

During a telephone conversation with Jacques Etkowicz on May 30, 2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-47. Affirmation of this election must be made by applicant in replying to this Office action. Claims 48-50 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

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remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5-6, 8-12, 17, 20, 21, 25-26, 31 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19814575 (herein after '575, translation provided).

'575 discloses an optical sensor that determines at least one physical and chemical parameter in a sample gas or liquid. The sensor comprises at least one optical transmitter (coherent laser source), at least one optical receiver and at least one sensitive element (gas), especially a gas-sensitive element, which is arranged in an optical path (optical fiber) between the at least one optical transmitter and the at least one optical receiver and which can be exposed to the sample in addition to being able to modify its absorption and refractive index for electromagnetic radiation of a specific

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wavelength when the parameters of the sample are modified. The optical transmitter (2) (laser) and the optical receiver (4) are coupled to at least two interspaced sensitive elements (12, 13, 14) by at least one optical fiber (10) (see figure 1-5) (abstract). An evaluation unit (processor) is arranged downstream from the optical receiver for signal generation upon sample sensing (page 10-11). The Examiner had oral translation on the sections that were pointed out on the European search report. A full translation is being provided with this Office Action. The coupling means is being interpreted as the point on the optical fiber where the laser radiation is inputted. Page 11 states that ultraviolet light and infrared light wavelengths are employed in the sensor. It is inherent that filters are provided because this would allow certain wavelengths of light to pass from the optical fiber to the receiver detector. Regarding a second coupler, the Examiner is interpreting the end of the fiber optic before the light receiver as the second coupler. The exposed sample element is in the shape of a D (see fig. 4). Regarding the optical fiber being a hollow fiber and in a single mode (fig. 4 and 5). '575 teaches a polymer matrix for the sensing element (page 4). '575 states that the refractive index of the material  $N_2$  (core) <  $N_1$  (jacket) (see fig. 4 and 5).

Claims 1-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Lerber et al. (US 2002/0092977).

Lerber discloses a method and apparatus for measuring at least one physical parameter using an optical resonator. Light from a light source is fed into a resonator comprising a resonator and highly reflective couplers. Light coupled out of the

resonator fiber is detected by a light sensor. The resonator is built such that its losses depend on a physical parameter to be measured. The light fed to the light source is switched on and off in step-like manner and the corresponding build-up or decay of the light detector signal is used to determine the time constant of the resonator and therefrom the physical parameter (abstract). A basic set-up of the invention is shown in FIG. 1. It comprises a light source 1, the output of which is coupled into a first feed fiber 2. From first fiber 2, it passes into a resonator fiber 3. Two couplers 4, 5 are arranged at the ends of resonator fiber 3. The light emitted from second coupler 5 is fed into a second feed fiber 6 and led to a light detector 7. The set-up further comprises a driver circuit 8 for driving the light source and a signal-processing unit 9 for processing the signal from light detector 7 (para 23 and 24). The bandwidth of the light source is not more than 7000 GHz, since this is the maximum bandwidth that can be handled by chirped grating reflectors. The light source is a laser or a narrow bandwidth LED, but it can also be a regular LED, in particular when no grating reflectors are used (para. 36). Resonator fiber 3 should be designed such that it has a strong outreaching evanescent field. The fiber of FIG. 3 has a high index core 10 and a low index mantle 11 with circular or elliptic cross-section except for a flattened surface section 12 approaching core 10 (D shaped). Surface section 12 is used for receiving the substance, the absorption or scattering of which is to be measured. As this surface section is close to core 10, a strong evanescent optical field extends into the substance. An absorption or scattering measurement allows, for example, to determine the presence and concentration of a substance, in either quantitative or qualitative manner. While

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absorption is usually due to an intrinsic absorption of the substance, scattering can e.g. be caused by Raman, Brioullin or Rayleigh effects. One possible application is the monitoring of a chemical agent that changes its optical properties and in particular its absorption depending on the physical parameter to be measured. Such an agent can e.g. be a pH-sensitive or temperature sensitive chemical coated to surface section 12 of the fiber of FIG. 3. In the embodiment of FIG. 1, the resonator was operated in transmission. An alternative is shown in FIG. 6, where the resonator is operated in reflection. The light from feed fiber 2 is fed to a beam splitter 18, and from there through coupler 4 into a first end of resonator fiber 3. The second end of resonator fiber 3 is provided with a reflector 5' having a reflectivity of at least 90%. Light coming back through coupler 4 is led to beam splitter 18 and from there through feed fiber 6 to light detector 7. Reflector 5' is formed by a tapered end of resonator fiber 3, such as it is shown in FIG. 7. Such tapers behave as reflectors if the diameter of the waist or tip is smaller than the wavelength of the light. Tapers can provide total internal reflection, and they generate an outreaching evanescent near field at the tip. This field can be used for measuring purposes. Light source 1 can either be continuous or pulsed. When using a pulsed light source with a pulse length much shorter than the roundtrip-time in the resonator, achieving high intensities within the resonator is difficult. The embodiment of FIG. 9 can either be operated in amplifier mode or in lasing mode. If used in amplifier mode, light from light source 1 is coupled through feed fiber 2 and coupler 4 into resonator fiber 3, where it is amplified by stimulated emission of light from the active medium. Optical fibers are thin, flexible and chemically inactive, which makes

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them suitable for any biomedical applications. Fiber optic sensors can be placed in the body, even at very delicate locations, like inside human arteries. The disclosed invention provides is the sensing with fiber tapers, such as they are shown in FIG. 7. If a taper is used as an end reflector, then an indicator agent coating with capability to change the refractive index or absorption according to the measured parameter can be used. E.g. in absence of some measured chemical or protein the refractive index of the reagent coating is such that the taper provides a total internal reflection and the losses of the cavity are low. Resonator fiber 3 (as well as feed fibers 2, 6) are preferably monomode fibers. However, multimode fibers, in particular graded index fibers, can be used as well.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-47 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-56 of copending Application No. 10/017,367. Although the conflicting claims are not identical,



they are not patentably distinct from each other because the difference between the present claimed invention and the copending application is that the present claimed invention recites that the sensor having a portion thereof exposed to the sample gas or liquid, while the copending application recites that the passive fiber optic ring having a portion thereof exposed to the sample gas or liquid. However, the portion of the sensor can be broadly read as a portion of the passive fiber optic ring. Thus, they are not patentably distinct from each other. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-47 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-50 of copending Application No. 10/157,400. Although the conflicting claims are not identical, they are not patentably distinct from each other because the difference between the present claimed invention and the copending application is that the present claimed invention recites determining a level of the trace species in a gas or liquid sample based on the signal generated by the detector whereas 10/157,400 recites a processor couple to the detector for determining a level of the strain inducing into the substrate based on the rate of decay of the radiation in the passive fiber optic ring. However, the detection is based upon a state of decay of the signal generated by the detector (claim 2, present application). Thus, they are not patentably distinct from each other. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel P. Siefke whose telephone number is 571-272-1262. The examiner can normally be reached on M-F 7:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sam P. Siefke

A handwritten signature in black ink, appearing to be 'S P Siefke', written in a stylized, cursive-like font.

May 30, 2006